Kenneth Luberice, MD; Phillip Jenkins, BS; Marie Crandall, MD; Ziad Awad, MD; Brian Dalton, MD; Ruchir Puri, MD

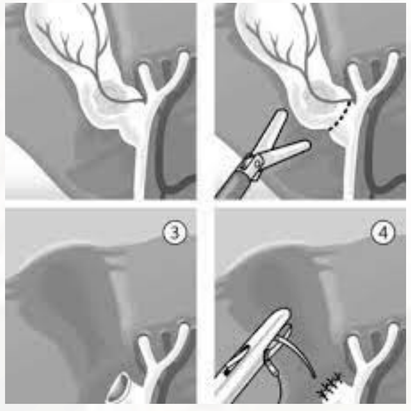
UNIVERSITY OF FLORIDA HEALTH

## INTRODUCTION

Laparoscopic cholecystectomy is the gold standard treatment modality for symptomatic gallbladder disease. In patients with more challenging presentations, the placement of a percutaneous cholecystostomy tube or a partial cholecystectomy are reasonable damage control options to minimize bile duct injuries. This study was undertaken to examine our single institutional results with partial cholecystectomy and to compare our outcomes to those of patients undergoing cholecystectomy following previous percutaneous cholecystostomy.

## METHODS

From December 2012-to-October 2020, 2,538 patients, underwent cholecystectomy and 71 patients underwent percutaneous cholecystostomy. With IRB approval, demographic data and perioperative outcomes were analyzed and compared between patients undergoing subtotal cholecystectomies and patients undergoing cholecystectomy status post percutaneous cholecystostomy drainage procedure. Statistical analysis was undertaken utilizing GraphPad Prism 8™ software. Nominal data were analyzed using Chi-Square Analysis. Interval data were analyzed utilizing non-parametric testing of means through Mann-Whitney U- Test. Data are presented as median (mean ± SD).




**Fenestrating Subtotal Cholecystectomy Undertaken in all Patients**

| | Subtotal Cholecystectomy | Lap Cholecystectomy post Percutaneous Cholecystostomy | |
|---|---|---|---|
| | *15* | *11* | *Total* | *p-Value* |
| *Demographics* | | | |
| ***Age (years)*** | ***55(57 ± 17.7)*** | ***75(75 ± 14.3)*** | ***0.006*** |
| **Gender (Men/Woman)** | 53%M / 64% W | 33%M / 55% W | NS |
| **BMI (kg/m2)** | 33(33 ± 7.9) | 29(29 ± 7.9) | NS |
| **Previous Intra-abdominal Surgery** | 33% | 64% | NS |
| **Preoperative Total Bilirubin** | 0.7(1.6 ± 1.9) | 0.4(0.8 ± 0.93) | NS |
| **Preoperative WBC** | 10.9 (13.7 ± 7.23) | 6.2(7.2 ± 3.09) | NS |
| ***ASA Classification*** | ***2(2 ± 0.63)*** | ***3(3 ± 0.53)*** | ***0.007*** |
| *Intraoperative Course* | | | |
| **Operative Duration (mins)** | 159(157 ± 67.9.) | 91(134 ± 81.3) | NS |
| **Estimated Blood Loss (mL)** | 100(280 ± 274.02) | 40(118 ± 229.9) | NS |
| **Intra-Operative Cholangiogram** | 27% | 18% | NS |
| ***Conversions to open*** | ***60%*** | ***18%*** | ***0.03*** |
| **Intra-Operative Complications** | 53% | 45% | NS |
| ***Drain Placement*** | ***80%*** | ***27%*** | ***0.007*** |
| *Postoperative Course* | | | |
| *Length of Stay (days) [operation - discharge]* | *7(8 ± 4.7)* | *2(4 ± 5.2)* | *0.06* |
| **Total Length of Stay (days) [admission - discharge]** | 10(11 ± 7.1) | 4(6 ± 7.2) | *0.08* |
| **ICU Length of Stay (day)** | 0(1 ± 2.1) | 0(1 ± 1.5) | NS |
| **Discharge with Drain** | 50% | 0% | NS |
| ***Postoperative Complications*** | 33% | 9% | NS |
| **In-hospital Mortality** | 0% | 0% | NS |
| **Readmission within 90 Days** | 7% | 0% | NS |
| **30 Day Mortality** | 0% | 0% | NS |

**Demographic and perioperative outcomes of patients undergoing cholecystectomy**

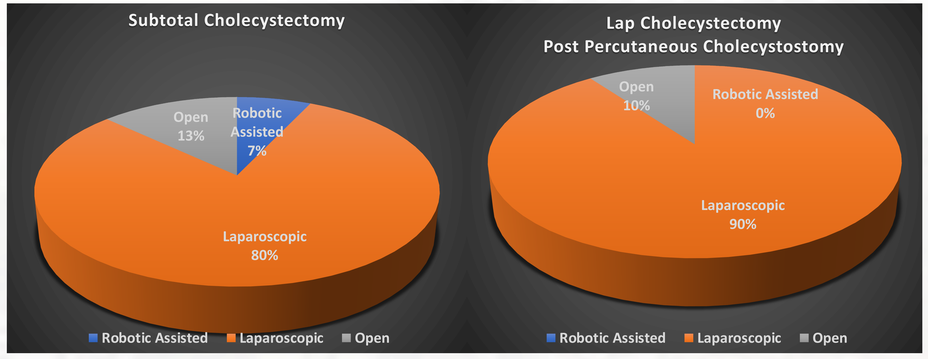



**Figure: Initial Approaches Undertaken between groups were not different**

## RESULTS

Of all patients undergoing cholecystectomy, 15 (<1%) underwent subtotal cholecystectomy. Of the 71-patients that underwent percutaneous cholecystostomy, 11 (16%) underwent subsequent cholecystectomy. Time until subsequent cholecystectomy was 9(13±13.8) months. Relative to patients undergoing cholecystostomy, patients who underwent subtotal cholecystectomy were significantly younger and had a lower ASA class, p=0.006, p=0.007, respectively. There was no difference in operative duration, estimated blood loss (EBL), or use of intraoperative cholangiogram (IOC), between patients who underwent subtotal cholecystectomy vs. laparoscopic cholecystectomy after percutaneous tube placement. (Table 1)

Sixty percent of subtotal cholecystectomies were converted to open, vs. 18% of laparoscopic cholecystectomies post percutaneous cholecystostomy (p =0.03). Intraoperative drain placement in patients undergoing subtotal vs laparoscopic cholecystectomy post cholecystostomy was 80% vs. 27%, respectively (p = 0.007).

Postoperatively, outcomes between patients undergoing subtotal cholecystectomy vs. cholecystectomy post-cholecystostomy were not different. There was no difference in LOS, ICU LOS, postoperative complications, discharge with drain, nor readmissions with-in 30, 60, or 90 days.

## CONCLUSION

Damage control in acute cholecystitis can be obtained by either a percutaneous drain placement or a partial resection. Subtotal cholecystectomy is a feasible damage control option if adverse anatomy is encountered intraoperatively. Selecting patients to apply percutaneous cholecystostomy vs. laparoscopic cholecystectomy is of paramount importance. Laparoscopic cholecystectomy following a percutaneous cholecystostomy is associated with lower conversions to open, and trend towards decreased LOS and complications. Despite their differences both approaches may help minimize bile duct injuries.